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# मानक

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IS 3763 (1983): metal folding chairs - Specification [CED  
35: Furniture]



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*Indian Standard*  
SPECIFICATION FOR  
METAL FOLDING CHAIRS  
( *First Revision* )

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# *Indian Standard*

## SPECIFICATION FOR METAL FOLDING CHAIRS

### ( *First Revision* )

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*Indian Standard*  
SPECIFICATION FOR  
METAL FOLDING CHAIRS  
( *First Revision* )

0. FOREWORD

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 30 December 1983, after the draft finalized by the Furniture Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** Sheet metal furniture is being made in the country for over a number of years. However, the sizes, finish and function of furniture items as made by various manufacturers required to be co-ordinated. This standard was, therefore, first prepared in 1966 to rationalize the sizes and to specify the finishes consistent with corrosion protection. In this revision the grades for materials to be used for components have been incorporated and thickness of mild steel tubular pipe has been reduced to 1.25 mm.

**0.3** This standard contains clauses which require the purchaser to supply certain technical information at the time of placing orders.

**0.4** In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to practices in the field in this country.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**1. SCOPE**

**1.1** This standard covers the requirements for materials, sizes construction and finish of metal folding chairs.

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\*Rules for rounding off numerical values ( revised ),

## 2. MATERIALS

**2.1 Electrodes** — Electrodes for gas, arc and spot welding shall conform to IS : 1278-1972\* and IS : 814 ( Part 1 )-1974†.

**2.2 Mild Steel Sheets** — Mild steel sheets shall conform to grade O of IS : 1513-1973‡ or grade O of IS : 1079-1973§.

**2.3 Mild Steel Tubes** — Mild steel tubes shall conform to IS : 7138-1973||.

**2.4 Aluminium Sheets** — Aluminium sheets shall conform to H2 conditions of 31000 or 52000 quality of IS : 737-1974¶.

**2.5 Aluminium Tubes** — Aluminium tubes used shall have the following minimum properties:

Tensile strength	260 N/mm <sup>2</sup>
Elongation on 50 mm gauge length	18 percent

**2.6 Screws** — Screws shall conform to IS : 1365-1978\*\*.

## 3. FABRICATION

**3.1 Components** — Metal folding chairs shall be assembled from the components given in 3.2 to 3.5.

**3.2 Tubular Frame** — The frame shall be made from mild steel tubular pipe with a thickness of not less than 1.25 mm and outside diameter of 25 mm. The aluminium tubular pipe may be square in cross section. The wall thickness of aluminium tubular pipe shall not be less than 2.00 mm and outside dimensions shall not be less than 25 mm.

**3.2.1 Ends of Tubes** — The bottom ends of chair legs may be provided with caps made of metal, plastic, rubber or other resilient material which will not mark the floor and is resistant to sliding. The caps or shoes and the end of the tubes shall be so fabricated that cutting or shearing of the caps during usage of the chair will be minimum. The top ends of the rear legs may be plugged or covered with metal, plastic or rubber caps of a similar material as used for the bottom ends.

\*Specification for filler rods and wires for gas welding ( *second revision* ).

†Specification for covered electrodes for metal arc welding of structural steel : Part 1 For welding products other than sheets ( *fourth revision* ).

‡Specification for cold-rolled carbon steel sheets ( *second revision* ).

§Specification for hot rolled carbon steel sheet and strip ( *third revision* ).

||Specification for steel tubes for furniture purposes.

¶Specification for wrought aluminium and aluminium alloys, sheet and strip ( for general engineering purposes ) ( *second revision* ).

\*\*Specification for slotted countersunk head screws ( *third revision* ).



**3.3 Seat** — The seat shall be fabricated from a single piece of mild steel sheet not less than 0.8 mm thick or from aluminium sheets not less than 1.6 mm thick and shall be formed in such a manner to provide strength and rigidity and to eliminate sharp edges.

**3.4 Backrest** — The backrest shall be not less than 100 mm high and fabricated from a single piece of mild steel sheet not less than 1.00 mm thick or from aluminium sheet not less than 1.6 mm thick, to a comfortable form-fitting shape. All edges shall be formed to provide maximum strength to the back. There shall be no sharp exposed edges. The backrest may also be padded, covered or fabricated out of plywood.

**3.5 Shoes** — The chair legs shall be provided with replaceable shoes made of good quality plastic, rubber or other resilient material which will not mar floors and is resistant to sliding. The shoes and chair legs shall be so fabricated that cutting or shearing of the shoes during usage of the chairs will be held to a minimum.

## 4. ASSEMBLY

**4.1 Design** — The structural design of the chairs shall be such that any sustained and impact weight will be uniformly distributed on all supporting parts with no excessive strain on any one or pair of supporting parts under normal usage. When in use, the chair shall not collapse due to a shift in weight of the user. The folding mechanism shall be of such design as to guard against personal injury and snagging or tearing of clothing. The design shall be such that one person can easily fold and unfold the chairs. The chairs shall fold compactly to permit stacking directly over one another in free and standing pile.

**4.2** The various components shall be assembled by means of riveting, bolting or welding.

**4.3** The method of gas welding, arc welding and spot welding shall conform to IS : 1323-1966\*, IS : 816-1969† and IS : 819-1957‡ and IS : 2812-1964§ respectively.

## 5. DIMENSIONS

**5.1** Dimensions of the chairs shall be as given in 5.1.1 to 5.1.3.

\*Code of practice for oxy-acetylene welding for structural work in mild steel (*first revision*).

†Code of practice for use of metal arc welding for general construction in mild steel (*first revision*).

‡Code of practice for resistance spot welding for light assemblies in mild steel.

§Recommendations for manual tungsten inert-gas, arc-welding of aluminium and aluminium alloys.

**5.1.1 Seat Height from Floor** — The height of seat of chair shall be  $430 \pm 5$  mm ( see 0.2 ).

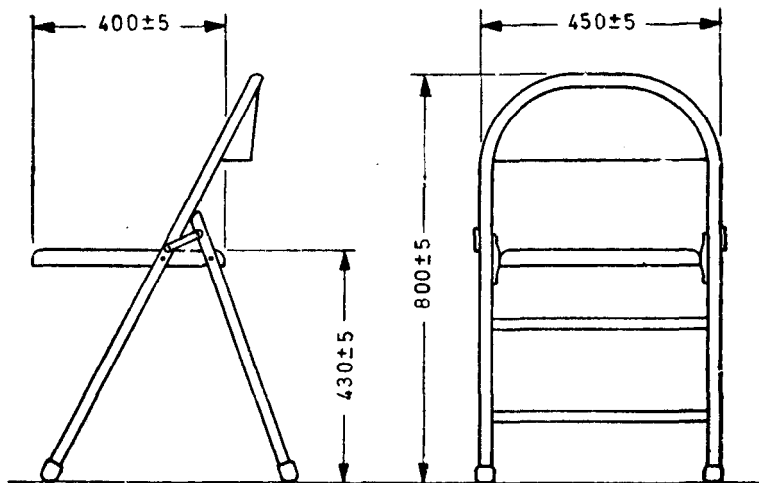
**5.1.2 Width of Seat** — The minimum width of seat shall be 400 mm measured at a point midway along the effective depth of the seat.

**5.1.3 Effective Depth of Seat** — Maximum effective depth of seat shall be  $400 \pm 5$  mm. This shall be measured from a vertical line through the centre of the front edge of the seat to a vertical line through the centre of the back edge of the seat.

**5.2** The overall dimensions of the folding chair shall be as given below ( see Fig. 1 ):

- |                          |          |
|--------------------------|----------|
| a) Overall folded length | 1 000 mm |
| b) Overall height        | 800 mm   |
| c) Overall width         | 450 mm   |

**5.3 Tolerances** — The overall dimensions specified in 5.2 shall not vary by more than  $\pm 5$  mm.



All dimensions in millimetres.

FIG. 1 TYPICAL SKETCH OF FOLDING CHAIR.

## 6. FINISH

**6.1** All dents, burrs and sharp edges shall be removed from the various components. The components shall be individually pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign element.

**6.2** Immediately after picking all the mild steel parts shall be given phosphating treatment conforming to Class C of IS : 3618-1966\*. The process for application of phosphate coating shall be in accordance with IS : 6005-1970†.

NOTE — Putty shall be applied to all the surfaces requiring filling and shall conform to IS : 110-1968‡. Aluminium primer shall conform to IS : 5660-1970§.

**6.3** Coat/Coats of enamel paint shall then be applied as follows:

- a) Finish coat with enamels conforming to IS : 151-1950||, IS : 2932-1974¶ or IS : 2933-1975\*\*, and
- b) In case of stoving enamel the components shall thereafter be baked at a specified temperature in an oven heated uniformly. The finish shall be smooth and uniform with a hard and tough film of enamel strongly adhering to the surface. The finish shall be free from all visible defects and shall not chip when tapped lightly with a dull pointed instrument.

**6.4** All components shall be finished in colour as agreed to between the purchaser and the manufacturer.

## 7. PERFORMANCE REQUIREMENTS OF FINISH

**7.1 Scratch Hardness Test** — A sample of mild steel plate 150 × 50 mm in size and thickness 0.315 mm and finished as given in 6 shall be subjected to scratch hardness test in accordance with 15.1 of IS : 101-1964††. A scratch, showing the bare metal shall not be produced on the test sample.

**7.2 Pressure Test** — Samples prepared from mild steel plates of thickness 0.315 mm and finished as given in 6 shall be subjected to pressure test in accordance with 15.2 of IS : 101-1964††. The metal surface shall not be rendered visible when the test pieces are separated after the test.

**7.3 Flexibility and Adhesion Test** — A sample of mild steel plate 150 × 50 mm in size and thickness 0.315 mm and finished as given in 6 shall be subjected to flexibility and adhesion test in accordance with 16 of IS : 101-1964††. The paint film on the test piece shall not show damage, detachment or cracking when examined under ×10 magnification.

\*Specification for phosphate treatment of iron and steel for protection against corrosion.

†Code of practice for phosphating of iron and steel.

‡Specification for ready mixed paint, brushing, grey filler, for enamels for use over primers (*first revision*).

§Specification for ready mixed paint, brushing, aluminium red oxide primer.

||Specification for ready mixed paint, spraying, finishing, stoving, enamel, for general purposes, colour as required.

¶Specification for enamel, synthetic, exterior (a) undercoating (b) finishing (*first revision*).

\*\*Specification for enamel, exterior (a) undercoating, (b) finishing (*first revision*).

††Methods of test for ready mixed paints and enamels (*second revision*).

**7.4 Stripping Test** — A sample of mild steel plate 150 × 50 mm in size and thickness 0.315 mm and finished as given in 6 shall be subjected to stripping test in accordance with 17 of IS : 101-1964\*. The scratch produced after the test shall be free from jagged edges.

**7.5 Test for Protection Against Corrosion Under Conditions of Condensation** — A mild steel panel of size 150 × 100 mm and thickness 1.25 mm and finished as given in 6 shall be subjected to test for protection against corrosion under conditions of condensation in accordance with 18 of IS : 101-1964\*. A metal surface shall show no signs of corrosion after the test.

## **8. INFORMATION TO BE SUPPLIED BY THE PURCHASER**

**8.1** The purchaser shall supply the following information to the supplier along with the order:

- a) Colour and finish; and
- b) Where alternative methods of construction and finish are specified, they shall be clearly stated in the order.

## **9. PACKING**

**9.1** All the component parts shall be packed in such a way that no damage is caused to them during transit.

## **10. MARKING**

**10.1** All metal folding chairs shall be marked with a suitable mark identifying the manufacturer.

**10.1.1** The metal folding chairs may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act, and the Rules and Regulations made thereunder. Presence of this Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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**\*Methods of test for ready mixed paints and enamels ( second revision ).**

# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	$1 \text{ N} = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volt	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/M}^2$

## INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110 002

Telephones : 26 60 21, 27 01 31

Telegrams : Manaksanstha

### Regional Office

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	89 65 28
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	27 60 90
Southern : C. I. T. Campus	MADRAS 600113	41 24 42
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### Branch Offices:

'Pushpak', Nurmohamed Shalkh Marg, Khanpur	AHMADABAD 380001	2 03 91
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